FINAL REPORT

FIRST STATUTORY FIVE-YEAR REVIEW of Remedies Implemented for

Part I -

PCB and Cadmium Impacted Shallow Soils at
Installation Restoration Site 02 (IR02),
Fleet and Industrial Supply Center Oakland,
Alameda Facility/Alameda Annex (FISCA)

And

Part II -

MARSH CRUST at Fleet and Industrial Supply Center Oakland,
Alameda Facility/Alameda Annex (FISCA), and
MARSH CRUST AND FORMER SUBTIDAL AREA at Alameda Point

Alameda, California

March 2006

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Prepared under:
Naval Facilities Engineering Command
Contract Number N68711-00-D-0004
Contract Task Order 0090

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FINAL REPORT

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Naval Facilities Engineering Command
Contract Number N68711-00-D-0004
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Approved By: **Date:**

THOMAS MACCHIARELLA
BRAC Environmental Coordinator
By direction of the Director

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PREAMBLE

This document contains two separate statutory five-year review reports, addressing remedies that have been implemented for mitigating environmental concerns associated with environmental media of interests at installations once operated by the Department of the Navy (DON) in Alameda, California.

Part I of this document contains the first statutory five-year review of the remedies implemented for PCB and cadmium impacted shallow soils of Site IR02. This site is located in the former Fleet and Industrial Supply Center Oakland, Alameda Facility/Alameda Annex (FISCA).

Part II of this document contains the first statutory five-year review of the remedy implemented for marsh crust and former subtidal area materials underlying FISCA as well as the former Naval Air Station (NAS) Alameda, now known as Alameda Point.

Part I and Part II of this document are not connected with each other in any way, except they provide five-year reviews of remedial actions implemented at nearly the same installations, i.e., the DON's Alameda facilities. The two reports are presented under same cover as a single document for convenience.

PART I

FINAL REPORT

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FIRST STATUTORY FIVE-YEAR REVIEW of REMEDIES IMPLEMENTED for PCB and CADMIUM IMPACTED SHALLOW SOILS at INSTALLATION RESTORATION SITE 02 (IR02), FLEET AND INDUSTRIAL SUPPLY CENTER OAKLAND, ALAMEDA FACILITY/ALAMEDA ANNEX (FISCA) ALAMEDA, CALIFORNIA

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EXECUTIVE SUMMARY

This report presents the results of the first statutory five-year review of polychlorinated biphenyl (PCB) and cadmium impacted shallow soil remedial actions that have been implemented at Installation Restoration (IR) Site 02 (IR02), located at the Fleet and Industrial Supply Center Oakland, Alameda Facility/Alameda Annex (FISCA), Alameda, California. These remedies have been described and published in the Site IR02 Remedial Action Plan/Record of Decision (RAP/ROD) of June 25, 2001. This decision document was approved by the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) on June 26, 2001.

This five-year review report was prepared by Brown and Caldwell under subcontract with CDM Federal Programs Corporation for the Navy Multi-Media Contract N68711-00-D-0004, and conducted in accordance with the Department of the Navy (DON) and Marine Corps *Policy for Conducting Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Statutory Five-Year Reviews*, revised May 2004, and the USEPA's *Comprehensive Five-Year Review Guidance* dated June 2001.

The five-year review process for Site IR02 involved reviews of relevant site documents and data, a visual inspection of Site IR02, and interviews with persons involved with many aspects of selection and implementation of the remedies for the PCB and cadmium impacted shallow soils of Site IR02. The purpose of this five-year review was to evaluate whether the remedies that have been implemented for PCB and cadmium impacted shallow soils at Site IR02 remained protective of human health and the environment at that site as intended by the decision documents. The methods used in assessing the implementation and performance of the selected remedies, as well as the findings and conclusions of these evaluations are documented in this five-year review report.

The Site IR02 RAP/ROD identified future planned land uses of Site IR02, about 10.6 acres in size, as residential for the western one-third of Site IR02 and industrial for the eastern two-thirds of Site IR02. The RAP/ROD identified the selected remedies for Site IR02 as excavation of PCB and cadmium impacted shallow soils at both of these two portions of Site IR02 typically to depths of about one foot below existing ground surface in areas where PCB and cadmium concentrations in the shallow soils of Site IR02 exceeded the cleanup levels selected for the two land use scenarios; and off-site disposal of the excavated soils. In addition, land use controls were put into effect which allow industrial use but not residential use of the eastern two-thirds of Site IR02. PCBs and cadmium remain in the shallow soils in the eastern two-thirds portion of Site IR02 above levels that would allow this portion for residential use, but at or below levels that would allow this portion for industrial use.

Based on the findings of this five-year review, the PCB and cadmium impacted shallow soil remedies for Site IR02 have been implemented as intended by the decision documents, and, the completed remedies continue to meet the remedial action objectives

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(RAOs), and appear to provide the means for adequately protecting human health and the environment at Site IR02 with respect to PCB and cadmium impacted shallow soils.

Concentrations of PCBs and cadmium in shallow soils of Site IR02 have been reduced to levels acceptable for the two planned land use scenarios identified for Site IR02, suitably addressing the threats to human health and the environment at Site IR02 through removal of unsuitable PCB and cadmium impacted shallow soils to regulated off-site disposal facilities. Land use controls in effect clearly delineate the planned residential and industrial use portions of Site IR02. The Catellus Development Corporation's Site Management Plan in use at Site IR02 provides guidelines for conducting the redevelopment of Site IR02 in a manner protective of the health and safety of site workers, future site residents, nearby residents, and the environment.

Technical or physical issues related to the remedies implemented for PCB and cadmium impacted shallow soils at Site IR02 that would be likely to reverse the current conditions were not discovered in this five-year review.

On the basis of the findings of this five-year review, conducting further five-year reviews for the remediated PCB and cadmium impacted shallow soils of the residential use portion of Site IR02 was not found to be warranted. Following the successful completion of remedy implementation, this portion of Site IR02 has been accepted by the regulatory oversight agencies as being suitably remediated with respect to PCB and cadmium impacted shallow soils.

Land use controls have been put into effect for the eastern two-thirds portion of Site IR02 which is currently being developed under an industrial use scenario. This portion of Site IR02 has not been accepted by the regulatory oversight agencies as being suitable for unrestricted exposure and unlimited use, without restrictions, with respect to PCB and cadmium impacted shallow soils.

On the basis of the observations and findings of this five-year review, unless new information related to human health and environmental risks as currently understood to be potentially posed by PCB and cadmium concentrations remaining in shallow soils in the planned industrial use portion of Site IR02 is identified that would no longer require restricting exposure of residents, workers or the environment to these soils, or, if in the future it is decided to develop this portion of Site IR02 for residential use and additional shallow soil remediation is performed, conducting the next five-year review of the land use controls currently in effect for the industrial use portion of Site IR02 is recommended.

As such, the next Statutory Five-Year Review of land use controls remedy currently in effect for the eastern two-thirds industrial use portion of Site IR02 needs to be completed within the next five years, or before July 2011.

The DON intends to prepare a Land Use Controls Remedial Design (LUC RD) for Site IR02 in FY 2006. The LUC RD will develop protocols for the enforcement and

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monitoring of land use restrictions implemented at the eastern, planned industrial use portion of Site IR02 with respect to PCB and cadmium impacted shallow site soils.

Documents reviewed and interviews conducted for this five-year review indicated the existence of environmental issues for Site IR02 other than PCBs and cadmium in shallow site soils. Some of these Site IR02 environmental issues have been resolved in the past. Other environmental issues are currently being addressed. Even though these environmental issues were not a part of this five-year review for PCB and cadmium impacted shallow soils of Site IR02, collectively, these issues appear to have an impact on final decisions related to an overall unrestricted use potential of the western one-third of Site IR02. As such, these environmental issues are summarized below.

The 1996 Site IR02 Remedial Investigation results indicated the presence of lead in soils of an area south of Building 365 within Site IR02, with concentrations ranging up to 26,600 mg/kg, and an estimated volume of 150 cubic yards. This area was remediated in 1996 to a risk-based lead cleanup level of 324 mg/kg. About 240 cubic yards of soil were removed and disposed off-site. When a confirmatory sample showed that lead remained along the western sidewall at concentrations above 324 mg/kg, an additional 5 cubic yards was removed and disposed off-site. The five final confirmation samples verified that the cleanup level of 324 mg/kg lead had been achieved.

Remedial excavations in a portion of the planned residential use area of Site IR02 uncovered the remains of what appeared to be various types of instruments. Because of the concern that instrument dials used during the World War II era sometimes used radium paint for illumination, further investigation was conducted at this location to ascertain whether radiation associated with radium was present in these soils. All the soils that had been excavated from within this area were spread out in a 1-foot thick layer and screened with a gamma scintillation detector capable of detecting radiation emitted by radium. There were no detections of radiation above background.

In its letter dated February 27, 2004 to the DON, the DTSC acknowledged its receipt and review of the final closeout report dated December 26, 2001 for Site IR02 shallow soil remediation. The DTSC in its letter also stated that the California Department of Health Services had reviewed the DON's findings of the radiological survey DON had conducted at Site IR02, and on November 13, 2003 it had notified the DTSC that with respect to radiological issues, Site IR02 was acceptable for unrestricted release.

Polyaromatic hydrocarbons (PAHs) have been reported in the historical fill materials underlying Site IR02 and FISCA, at concentrations that can cause restrictions of the use of portions of these properties for residential purposes.

A groundwater plume containing benzene and naphthalene has been reported to exist beneath Site IR02 and FISCA. Environmental restrictions exist between the DON and the City of Alameda and the DTSC dated July 20, 2000, which prohibit the use of shallowest groundwater beneath Site IR02 and FISCA until this groundwater has been suitably

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remediated. Groundwater benzene and naphthalene issues for Site IR02 are currently being addressed under separate environmental assessments and documents. The DTSC has stated that regulatory acceptance and concurrence for overall unrestricted use of the western one-third portion of Site IR02 would be dependent on the satisfactory resolution of these remaining environmental issues for Site IR02.

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FIGURES

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ACRONYMS AND ABBREVIATIONS

ARAR	applicable or relevant and appropriate requirement
ARRA	Alameda Reuse and Redevelopment Authority
BCT	Base Closure Team
BRAC	Base Realignment and Closure
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COPC	chemical of potential concern
CFR	*Code of Federal Regulations*
COC	chemicals of concern
CSF	carcinogenic slope factor
cy	cubic yard
DoD	Department of Defense
DON	Department of the Navy
DRMO	Defense Reutilization and Marketing Office
DTSC	California Environmental Protection Agency, Department of Toxic Substances Control
EBMUB	East Bay Metropolitan Utility District
ELCR	excess lifetime cancer risk
FISCA	Fleet and Industrial Supply Center Oakland, Alameda Facility/Alameda Annex
FS	feasibility study
FSP	Field Sampling Plan
HHRA	human health risk assessment
HI	hazard index
IR	Installation Restoration (Program)
LUC	Land Use Controls
LUCICP	Land Use Controls Implementation and Certification Plan
LUC RD	Land Use Control Remedial Design
mg/kg	milligrams per kilogram
NAS	Naval Air Station
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
NSC	Naval Supply Center
OSHA	Occupational Safety and Health Association

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Field Code Changed

PA	Preliminary Assessment
PCB	polychlorinated biphenyl
PP	Proposed Plan
ppm	parts per million
QAPP	Quality Assurance Project Plan
RAB	Restoration Advisory Board
RAO	remedial action objective
RAP	remedial action plan
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RFA	RCRA Facility Assessment
RfD	reference dose
RI	remedial investigation
ROD	Record of Decision
RWQCB	Regional Water Quality Control Board
SARA	Superfund Amendment and Reauthorization Act
SI	Site Investigation
SMP	Site Management Plan
SWMU	Solid Waste Management Unit
TCLP	Toxicity Characteristic Leaching Procedure
UCL_{95}	95 percent upper confidence level
USEPA	United States Environmental Protection Agency

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SWDIV Southwest Division Naval Facilities Engineering Command¶
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SUMMARY FORM

FIRST STATUTORY FIVE-YEAR REVIEW

SITE IR02 PCB and CADMIUM IMPACTED SHALLOW SOIL REMEDIATION

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SITE IDENTIFICATION		
Site Name: Site IR02, Fleet and Industrial Supply Center Oakland, Alameda Facility/Alameda Annex		
EPA ID: 2170023236		
Region: IX	**State:** CA	**City/County:** Alameda / Alameda

SITE STATUS	
NPL Status: ☐ Final ☐ Deleted ■ Other (specify) Site IR02 is **not** on the National Priorities List	
Remediation Status (choose all that apply): ☐ Under Construction ☐ Operating ■ Complete	
Multiple OUs?* ☐ YES ■NO	**Remediation Completion Date:** 11 / 05 / 2001
Has site been put into reuse? ■YES ☐ NO	

REVIEW STATUS	
Lead agency: ☐ EPA ☐ State ☐ Tribe ■ Other Federal Agency : Department of the Navy	
Author name: Southwest Division Naval Facilities Engineering Command (SWDIV)	
Author title:	**Author affiliation:**
Review period: 05 / 09 / 2005 to 07 / 01 / 2006	
Date(s) of site inspection: 05 / 09 / 2005 to 05 / 12 / 2005	
Type of review: ☐ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only ■ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead ☐ Regional Discretion	
Review number: ■1 (first) ☐ 2 (second) ☐ 3 (third) ☐ Other (specify) _____	
Triggering action: ☐ Actual RA Onsite Construction at OU#____ ■ Actual RA Start at Site IR02 - Initiation of Remedy Implementation, July 05, 2001 ■ Other (specify): Signing of the Record of Decision, June 26, 2001	☐ Construction Completion ☐ Previous Five-Year Review Report
Triggering action date: 06 / 26 / 2001	
Due date *(five years after triggering action date)*: 07 / 05 / 2006 - Remedy Implementation triggers review.	

* "OU" refers to operable unit.

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SUMMARY FORM (continued)

FIRST STATUTORY FIVE-YEAR REVIEW

SITE IR02 PCB and CADMIUM IMPACTED SHALLOW SOIL REMEDIATION

Issues, Recommendations and Follow-up Actions:

This five-year review did not discover issues relative to the performance of the PCB and cadmium impacted shallow soil remedies implemented at Site IR02. Shallow soils with PCBs and cadmium exceeding cleanup levels selected for the two planned land use scenarios (residential use of the western portions and industrial use of the eastern portions) have been removed from Site IR02. The site is under development in accordance with decision documents and under the oversight of regulatory agencies; the residential and industrial use portions of Site IR02 have been clearly delineated. Site conditions that could result in having potential adverse effects on the future protectiveness of the remedies were not observed.

On the basis of the findings of this five-year review, conducting further five-year reviews for the remediated shallow soils of the residential use portion of Site IR02, with respect to PCB and cadmium impacted shallow soils, was not found to be warranted. Following the successful completion of remedy implementation, this portion of Site IR02 has been accepted by the regulatory oversight agencies as being suitably remediated, with respect to PCB and cadmium impacted shallow soils.

Land use controls have been put into effect for the eastern two-thirds portion of Site IR02 which is currently being developed under an industrial use scenario. This portion of Site IR02 has not been accepted by the regulatory oversight agencies as being suitable for unrestricted exposure and unlimited use, without restrictions, with respect to PCB and cadmium impacted shallow soils. As such, conducting further five-year reviews of the land use controls remedy implemented for the eastern portions of Site IR02 is recommended, and it is required by the NCP. Accordingly, the next Statutory Five-Year Review of land use controls remedy currently in effect for the eastern two-thirds planned industrial use portion of Site IR02 needs to be completed within the next five years, or before July 2011.

The DON intends to prepare a Land Use Controls Remedial Design (LUC RD) for Site IR02 in FY 2006. The LUC RD will develop protocols for the enforcement and monitoring of land use controls remedy implemented at the eastern, planned industrial use portion of Site IR02 with respect to PCB and cadmium impacted shallow soils of Site IR02.

Protectiveness Statement:

The shallow soil remedies implemented for PCB and cadmium impacted shallow soils at Site IR02 currently provide the protectiveness of human health and the environment intended by the decision documents. Concentrations of PCBs and cadmium in shallow soils of Site IR02 have been reduced to acceptable levels, suitably addressing threats to human health and the environment at Site IR02 through removal of unsuitable PCB and cadmium impacted shallow soils to regulated off-site disposal facilities. Land use controls in effect clearly delineate the planned residential and industrial use portions of Site IR02. The Catellus Development Corporation's Site Management Plan provides guidelines for conducting the redevelopment of Site IR02 in a manner protective of the health and safety of site workers, future site residents, nearby residents, and the environment. Technical or physical issues related to PCB and cadmium impacted shallow soils at Site IR02 that would be likely to reverse the current conditions and the implemented remedy were not discovered in this five-year review.

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Section 1
INTRODUCTION

This report presents the results of the first statutory five-year review of remedies that have been implemented at Installation Restoration (IR) Site 02 (IR02) in response to polychlorinated biphenyls (PCBs) and cadmium reported in shallow site soils. These remedies have been described and published in Site IR02 Remedial Action Plan/Record of Decision (RAP/ROD) dated June 25, 2001. This decision document was approved by the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) on June 26, 2001. Site IR02 is located at the Fleet and Industrial Supply Center Oakland, Alameda Facility/Alameda Annex (FISCA), Alameda, California (Figure 1).

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The purpose of five-year reviews is to evaluate whether a remedy that has been implemented at a site remains protective of human health and the environment at that site. The methods used in assessing the implementation and performance of the selected remedy, as well as the findings and conclusions of these evaluations are documented in five-year review reports.

A five-year review report provides a clear statement as to whether the selected remedy is being protective, or if it is expected to become protective sometime in the future. In the event a five-year review finds deficiencies to exist in remedy implementation or in the performance of the remedy itself which could lead to non-protectiveness of human health and the environment, the five-year review report would identify such issues, and provide recommendations as to how these issues can be resolved. Similarly, if the five-year review finds that assumptions, regulatory requirements and/or analytical methods used to establish cleanup goals for the chemicals of concern at the time of selecting and implementing the remedy have changed during the five years covered by the review, which could lead to non-protectiveness of human health and the environment, then the five-year review would identify such changes and provide recommendations as to how to address such issues. As such, the five-year review report would contain recommendations of specific actions that would provide the means for the remedy to become or to continue being protective.

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Five-year reviews are required by statue in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (Title 42 *United States Code* 9601), commonly referred to as the "Superfund," as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986. CERCLA §121(c), as amended, states:

> *"If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented."*

Additionally, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), Title 40 *Code of Federal Regulations* [CFR] §300.430(f)(4)(ii) states:

> *"If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use*

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and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action."

The Department of the Navy (DON) has interpreted these regulations as requirements for a five-year review when hazardous substances, pollutants, or contaminants remain at a site above levels that would allow for unlimited use and unrestricted exposure, and, if the RAP/ROD for the site was signed on or after October 17, 1986, when SARA was promulgated. The DON defines 'unlimited use' and 'unrestricted exposure' to mean no restrictions placed on the use of a site.

As such, the DON has undertaken the preparation of this statutory five-year review of the remedies implemented for mitigating PCB and cadmium impacted shallow soils of Site IR02 because the selected remedies include restrictions of two-thirds of Site IR02 to industrial use and do not allow its unrestricted use as PCB and cadmium concentrations remain in the shallow soils in this portion of Site IR02 above levels that would allow for its unlimited use and unrestricted exposure. CERCLA requires five-year reviews of remedies that include site use restrictions. Additionally, the RAP/ROD for Site IR02 was signed in June 2001, after promulgation of SARA.

This is the first five-year review of the remedies implemented for PCB and cadmium impacted shallow soils of Site IR02. The triggering action for this review was the signing of the Site IR02 RAP/ROD in June 2001. This five-year review was conducted by the DON between May 2005 and July 2006.

This five-year review report is divided into ten sections and eight attachments, as described below.

Section 1 - an introduction into five-year reviews in general, and to this five-year review in particular.

Section 2 - a chronology of events related to Site IR02 PCB and cadmium impacted shallow soil evaluations and remediation.

Section 3 - Site IR02 background information, including physical setting, land and resource use, history of contamination, initial response, and the basis for taking remedial action.

Section 4 - remedy selection and implementation for the PCB and cadmium impacted shallow soils of Site IR02.

Section 5 - progress made since the last five-year review.

Section 6 - typical activities performed as part of a five-year review process, and the findings of this five-year review, including community involvement, the results of document and data review, site inspection, and interviews.

Section 7 - technical assessment of the remedies implemented at Site IR02.

Section 8 - issues identified, as well as conclusions, and recommendations as to how these issues can be resolved.

Section 9 - protectiveness statement for the remedies implemented for mitigation of PCB and cadmium impacted shallow soils of Site IR02.

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Section 10 - discussion of the next five-year review.

The following attachments are appended in support of and for completeness of this five-year review:

Attachments

A Listing of Site IR02 Documents Included In This First Five-Year Review

B Site Inspection Form, First Five-Year Review, PCB and Cadmium Impacted Shallow Soils Remediation at Site IR02

C Photographs of Site IR02 Taken During Site Inspection on May 10, 2005, First Five-Year Review, PCB and Cadmium Impacted Shallow Soils Remediation at Site IR02

D Interview Documentation Form, First Five-Year Review, PCB and Cadmium Impacted Shallow Soils Remediation at Site IR02

E Interview Records, First Five-Year Review, PCB and Cadmium Impacted Shallow Soils Remediation at Site IR02

F Applicable or Relevant and Appropriate Requirements (ARARs) Analysis Review, First Five-Year Review, PCB and Cadmium Impacted Shallow Soils Remediation at Site IR02

G Human Health Risk Assessment (HHRA) Review, First Five-Year Review, PCB and Cadmium Impacted Shallow Soils Remediation at Site IR02

H Copies of "Quitclaim Deed and Environmental Restrictions Pursuant to California Civil Code Section 1471 for FISC Alameda" between the Department of the Navy and the City of Alameda, dated July 17, 2000, recorded on July 20, 2000; "Interim Covenant to Restrict Use of Property – Environmental Restriction, Re: Fleet and Industrial Supply Center, Alameda Annex" between the Department of the Navy and the Department of Toxic Substances Control, recorded on July 20, 2000, for PCB and Cadmium Impacted Shallow Soils of Site IR02; and, letter from the DTSC to DON, dated February 27,2004, re: "Final Closeout Report, Removal of Contaminated Surface Soil at Installation Restoration Site 02 (IR02), Fleet and Industrial Supply Center Oakland, Alameda Facility/Alameda Annex (FISCA), Alameda, California".

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Section 2
CHRONOLOGY OF SITE EVENTS

Important and relevant information on historical site development, environmental investigation, remedial planning, and remedial action events in connection with PCB and cadmium impacted shallow soils of Site IR02 and the dates of these events are listed below in chronological order. These events typically include site assessment, preparation of decision documents, and remedial actions.

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CHRONOLOGY OF EVENTS

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PCB and Cadmium Impacted Shallow Soils of Site IR02

Event	Date
The property occupied by Alameda Facility/Alameda Annex (FISCA), which includes Site IR02, and surrounding area exists as undeveloped marshlands and tidal flats along the fringe of San Francisco Bay.	Prior to 1920's
The marshlands are covered with imported fill comprising sands and clays of unknown origin.	1925 - 1927
The developed area is used as a commercial airport.	1920 - 1941
US Government purchases the property for use as a depot.	1941 (Alameda Facility) and 1966 (Alameda Annex)
Command of Alameda Facility property transferred to Naval Supply Center (NSC) Oakland.	1964
Alameda Annex property transferred to NSC Oakland.	1980
The Defense Reutilization and Marketing office (DRMO), in conjunction with NSC Oakland, operates a screening lot and temporary equipment storage area on the western portion of area known today as Site IR02, and a scrap yard for temporary storage of discarded automobiles, stockpiling of scrap metal, and storage of surplus equipment on the eastern portion of Site IR02.	Until 1998
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also known as 'Superfund' is promulgated.	1980
Department of the Navy (DON) begins investigating sites under its Installation Restoration (IR) Program.	1980's
Superfund Amendments and Reauthorization Act (SARA) amends CERCLA.	1986
A Site Investigation (SI) is conducted by the DON at the area today known as Site IR02. The SI included review of aerial photographs, and collection and laboratory analyses of shallow soil samples from depths of 18 to 30 inches below ground surface. PCBs and cadmium were detected in the soil samples. The SI identified four areas on the site as potential sources of contamination; these areas appeared to be associated with then-ongoing DRMO activities.	1987
A Preliminary Assessment (PA) is conducted at the area today known as Site IR02. The PA did not collect or analyze soil samples, but reviewed available records, and included a site visit, and interviews with employees. The PA found that activities at this site may have impacted the environment, and recommended additional investigations.	1988

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CHRONOLOGY OF EVENTS

PCB and Cadmium Impacted Shallow Soils of Site IR02

Event	Date
The California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) conducts a Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) at FISCA. The RFA identified four solid waste management units (SWMUs). The screening lot and scrapyard area used by DRMO was designated as SWMU 1 (today known as Site IR02), and was recommended for additional investigation.	1993
Final Remedial Investigation (RI) report for FISCA is issued. The RI reported that site-use related soil contamination had been limited in general to the upper one foot of soil, and designated three specific areas within SWMU 1 (Site IR02) as candidates for interim remedial action. The shallow soils within SWMU 1 appeared to have been impacted by the screening lot and scrap yard activities, and included polychlorinated biphenyls (PCBs) and cadmium. The RI recommended that SWMU 1 be further considered in a Feasibility Study with respect to soil contamination and potential remedial action alternatives because of potential human health concerns associated with the source and extent of the chemicals identified in shallow site soils, and, because of the need for further evaluation of potential human health and ecological risk concerns that may be posed by these chemicals. California Regional Water Quality Control Board (RWQCB) and the DTSC identified interim cleanup goals for PCBs in soil as 1 milligram/kilogram (mg/kg).	January 1996
First removal action – involved removal of surface soils near Building 366, that was once located on the eastern portions of Site IR02. About 80 cy of surface soils with PCB concentrations up to 140 mg/kg were removed from an area west of Building 366 and disposed off-site, achieving the interim cleanup goal for PCB.	1996
Second removal action – About 84 cy of surface soils with PCB concentrations up to 29 mg/kg were removed from an area in the south-central portions of Site IR02 next to a railroad track, and disposed off-site, achieving the interim cleanup goal for PCB.	1998
FISCA is closed under the Base Realignment and Closure (BRAC) Act of 1990.	September 30, 1998
Final Feasibility Study (FS) report for FISCA is issued. The FS developed, screened and evaluated potential remedial actions that could be implemented at Site IR02 as a means for reducing human health risks that may be posed by the chemicals of concern that the RI identified in Site IR02 shallow soils. At the request of the regulatory agencies, the FS recalculated risks for some of the chemicals of concern in Site IR02 shallow soils on account of receiving new data since the original human health risk assessment (HHRA). PCBs and cadmium in shallow soils of Site IR02 were retained as the chemicals of concern and targeted for remediation.	January 22, 1999
Design basis report for removal of contaminated surface soils at Site IR02 is issued. The report presented the design basis for remedial action, and presented alternative methods for defining the limits of contaminated shallow soils that exceed the cleanup goals and as such that would be removed under the remedial action.	January 31, 2000

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CHRONOLOGY OF EVENTS

PCB and Cadmium Impacted Shallow Soils of Site IR02

Event	Date
DON and the City of Alameda execute a 'Quitclaim Deed and Environmental Restrictions Pursuant to California Civil Code Section 1471 for FISC Alameda' wherein the DON transfers the Fleet and Industrial Supply Center Oakland (FISCO), Alameda Facility/Alameda Annex, which includes Site IR02, to the City of Alameda. Interim restrictions for Site IR02 state that the site shall not be used for residential purposes and construction activities shall not begin until the DON and the DTSC have determined that the soils containing PCBs and cadmium concentrations have been properly remediated and that the DON has recorded a release terminating these Interim Restrictions.	July 17, 2000
DON and the DTSC execute an 'Interim Covenant to Restrict Use of Property (Environmental Restriction)' for the Fleet and Industrial Supply Center, Alameda Annex, which includes Site IR02, wherein the use of Site IR02 is restricted on an interim basis to protect human health and the environment. The Covenant anticipates that some or all of its Interim Restrictions may become unnecessary after adequate investigation and remediation of Site IR02.	July 17, 2000
DON issues its Proposed Plan (PP) for remediating PCB and cadmium impacted shallow soils at Site IR02 and invites public input into selection of the final remedy. The PP presented six potential remedial action alternatives and identified the preferred remedy as Alternative 4 – Excavation and Off-site Disposal and Land Use Controls.	April 2001
Final Remedial Design (RD) for removal of PCB and cadmium impacted shallow soils at Site IR02 based on the conclusions of the design basis report is issued.	May 09, 2001
Final Workplan, Final Quality Control Plan, and Final Site Safety and Health Plan are issued.	May 09, 2001
Final Field Sampling Plan and Final Quality Assurance Project Plan (FSP/QAPP) are issued. These plans contain descriptions of methods for collecting soil samples to further define areas of Site IR02 that previous investigations had shown as exceeding cleanup levels and as such requiring removal, and, methods for collecting confirmation samples of soils remaining following the removal action to asses the effectiveness of the remedy in removing the soils with chemical concentrations exceeding cleanup goals.	May 14, 2001
Final remedial action activities begin at Site IR02 – the site is surveyed and divided into grid squares, surface soils are sampled as defined in the FSP/QAPP.	May 14, 2001
Soil sampling is completed.	May 22, 2001
Laboratory analyses of soil samples are completed.	June 11, 2001

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CHRONOLOGY OF EVENTS

PCB and Cadmium Impacted Shallow Soils of Site IR02

Event	Date
The DON and the State of California (DTSC and RWQCB) sign the Remedial Action Plan/Record of Decision (RAP/ROD). The RAP/ROD states that consistent with and supported by the Final Feasibility Study of January 1999 for Site IR02 soils, the DON and the DTSC, with the concurrence of the RWQCB, have selected excavation of Site IR02 shallow soils containing PCBs and cadmium in concentrations exceeding cleanup goals, and disposal of the excavated soils in a permitted off-site landfill. According to the RAP/ROD, the western approximately one-third of Site IR02 would be developed for residential use and the eastern approximately two-thirds of Site IR02 would be developed for industrial and commercial use. Selected residential use cleanup goal for PCBs is 1 part per million (ppm), and for cadmium it is 12 ppm. Selected industrial use cleanup goal for PCBs is 10 ppm, and for cadmium it is 450 ppm. The RAP/ROD states that upon completion of the remedial action, the Interim Restrictions prohibiting residential use of Site IR02 established in the Quitclaim Deed for FISCO Alameda dated July 17, 2000 shall be released for the western one-third of Site IR02: which is the planned residential portion of Site IR02, but will be retained for the eastern two-thirds of Site IR02. The RAP/ROD further states that the Interim Covenant executed with the DTSC, dated July 17, 2000, shall release its restrictions for the western one-third of Site IR02 which is the residential portion of Site IR02. The Covenant restrictions shall continue to be in effect for the eastern two-thirds of Site IR02 which is the industrial and commercial portion of Site IR02.	June 26, 2001
Remedial soil removal activities begin.	July 05, 2001
Backfilling of excavated areas begin.	October 24, 2001
Remedial soil removal and confirmation soil sampling activities are completed.	November 05, 2001
Backfilling of excavated areas is completed.	November 06, 2001
Air monitoring for dust conducted at site perimeter during excavation and backfilling activities	July 06, 2001 through November 08, 2001
Final Closeout Report is issued. The report provides a description of PCB and cadmium impacted shallow soil remedial actions taken at Site IR02, and concludes that confirmation soil samples collected and analyzed after the completion of soil removal activities have shown that PCB and cadmium cleanup goals as approved in the RAP/ROD have been achieved; that the western one-third of Site IR02 is ready for unrestricted residential use with respect to PCB and cadmium impacted shallow soils, (now remediated); that the eastern two-thirds of Site IR02 is ready for unrestricted commercial and industrial use but restricted from residential use; and that no further remedial action is planned to be undertaken on the shallow soils at either area.	December 26, 2001
Site Management Plan (SMP) for Site IR02 is issued by Catellus Development Corporation, the developer of FISCA. The SMP provides guidelines and the means for redevelopment of Site IR02 in a manner protective of the health and safety of site workers, future site residents, nearby residents, and the environment. Regulatory oversight of implementing this SMP would be provided by the DTSC and the City of Alameda.	April 23, 2002
DTSC accepts that the remedies selected for PCB and cadmium impacted shallow soils of Site IR02 have been suitably implemented.	February 27, 2004
First Five-Year Review	May 2005 – July 2006
Site Inspection for first five-year review	May 10, 2005

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CHRONOLOGY OF EVENTS

PCB and Cadmium Impacted Shallow Soils of Site IR02

Event	Date
Document and data review for first five-year review	May 10 – June 24, 2005
Interviews for first five-year review	May 10 – June 24, 2005
Draft first five-year review report for PCB and cadmium impacted shallow soils of Site IR02 is issued for review and comments	August 2005
Final first five-year review report for PCB and cadmium impacted shallow soils of Site IR02 is issued	July 2006

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Section 3
SITE BACKGROUND

Site IR02 is located in the south-central portion of FISCA which in turn is located in the City of Alameda, adjacent to and east of the former Naval Air Station (NAS) Alameda, along the southern shore of the Oakland Inner Harbor in Alameda, California. Since 1998, FISCA has been closed and Site IR02 has been enclosed by a chain-link fence.

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This section presents Site IR02 background information, including physical setting, land and resource use, history of contamination, initial response, and the basis for taking remedial action in response to PCBs and cadmium reported in the shallow soils of Site IR02 at the time when the Site IR02 RAP/ROD was signed. The discussions and information presented in this section include major site activities undertaken prior to and following the signing of the RAP/ROD, with the intent of providing a basis for comparing the performance of the remedies implemented at Site IR02 with the conditions potentially posed by the PCB and cadmium impacted shallow soils of Site IR02 that the remedies were intended to mitigate.

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3.1 PHYSICAL SETTING

Site IR02 occupies approximately 10.6 acres in the south-central portion of FISCA property (Figure 1), which itself occupies about 143 acres and has served during its operation as part of the main supply facility supporting U.S. Department of Defense (DoD) operations of military fleets and shore activities in the Pacific Basin.

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Site IR02 is essentially level and unpaved, and enclosed by a chain-link fence. Surface and near-surface soils at FISCA consist of areal fill placed during historical filling of the tidal marshlands, now underlying Site IR02, and fill placed for subsequent site grading for Site IR02 development. The historical fill material is characterized by sands, clays, and silts dredged from the tidal flats in the region.

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Site IR02 is located in the City of Alameda, and according to the Site IR02 RI report, it was zoned as general industrial at the time when it was in operation. The areas surrounding Site IR02 were occupied by harbor facilities, commercial and industrial properties, residential developments, and schools.

FISCA property is part of the greater ecosystem of San Francisco Bay, which is the largest coastal embayment on the Pacific Coast and home to a diverse ecological community. Aquatic areas are present on the northern portion of the property, which borders the Oakland Inner Harbor. Four species, classified as endangered by both state and federal governments, inhabit the vicinity of the Oakland Inner Harbor: the California least tern, the peregrine falcon, the California brown pelican, and the winter run Chinook salmon. Although birds, including California brown pelicans, double-crested cormorants, and several species of gulls, and harbor seals have been observed in the area of the Oakland Inner Harbor, these species do not nest or feed in the area of Site IR02, because there is no supporting habitat on the site.

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3.2 LAND AND RESOURCE USE

Until the 1920s, FISCA and the surrounding area existed as undeveloped marshlands and tidal flats along the fringe of San Francisco Bay. The area south of FISCA, consisted primarily of residential properties. Before 1930, at least two large industrial sites (an oil refinery and a borax processing plant) were located on the western tip of Alameda Island. Several industries were located on the northern side of Oakland Inner Harbor, including two manufactured gas plants. Land use has been industrial since the land was created using imported fill between 1887 and 1939.

The Defense Reutilization and Marketing Office (DRMO) operated a screening lot and scrap yard at Site IR02 until 1998. DRMO was responsible for the sorting, resale, and proper disposal of property declared to be excess by the Department of Defense (DoD). Surplus equipment that was transferred to Site IR02 for processing may have contained fuel, oil, coolants, and other liquids that may have leaked onto exposed surface soil.

The western portion of Site IR02 was used as a screening lot and for temporary equipment storage. The eastern portion of Site IR02 was used as a scrap yard and for temporary storage of discarded automobiles, stockpiled scrap metal, and surplus equipment. An aboveground diesel tank in the northern central section of Site IR02 was used to fuel heavy equipment.

The Oakland Inner Harbor, located north of Site IR02, contained a ferry terminal, shipyards, several marinas, and yacht clubs. The area east of Site IR02 contained commercial and industrial properties. The area south of Site IR02 contained residential developments, including base housing, a child development center, several elementary schools, a middle school, and the College of Alameda. The area west of Site IR02 was occupied by Naval Air Station (NAS) Alameda and included base housing, a day care facility and public schools as well as industrial properties.

FISCA has undergone base closure on September 30, 1998. The Navy transferred title to the property to the City of Alameda on July 17, 2000 pursuant to an Economic Development Conveyance (EDC) conducted as an early transfer under CERCLA Section 120 (h)(3). As part of the overall plan for redevelopment of the property, the Alameda Reuse and Redevelopment Authority (ARRA) has determined that the western one-third of Site IR02 would be developed for residential use and the eastern two-thirds of Site IR02 would be developed for industrial use.

At the time of this five-year review site inspection (May 2005), structures which at one time had occupied Site IR02 had been removed. Redevelopment related construction activities were underway and included site grading and infrastructure construction. The area south of Site IR02 had been cleared and leveled. New detached individual family housing as well as a school was in construction further south of Site IR02 at the former East Housing Area that belonged to the former NAS Alameda, located west of Site IR02 and contained residential as well as commercial properties. Land use in areas east and north of Site IR02 have remained essentially unchanged.

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3.3 HISTORY OF CONTAMINATION

Contamination of Site IR02 soils was discovered as a result of site investigations following CERCLA, when the DON began investigating sites under its IR Program in the 1980s. Eight IR sites were identified at FISCA as a result of a PA/SI under CERCLA and a Resource Conservation and Recover Act (RCRA) Facility Assessment (RFA). Site IR02, then known as Solid Waste management Unit (SWMU) 1, was one of these eight sites.

A SI conducted at Site IR02 in 1987 as part of the IR Program included a review of aerial photographs, and collection of 30 shallow soil samples. The soil samples were analyzed for various chemical compounds, including priority pollutant metals and PCBs. The results of the SI soil sample analyses indicated that concentrations of metals and organic compounds were highest in soil samples collected near Building 365. PCBs were detected in 3 out of 30 soil samples.

Four areas within Site IR02 were identified as potential contamination sources. These areas appeared to be associated with DRMO operations and activities. A review of historical aerial photographs of Site IR02 conducted as part of the SI confirmed that the four areas where DRMO operations have been concentrated have had visible soil staining since the 1950s. These areas included the vicinity of Building 365, a scrap bin area adjacent to railroad tracks along the southern boundary of Site IR02, an area west of Building 366, and a storage area just west of the main entrance gate, on the northern boundary of Site IR02 (Figure 2).

A Remedial Investigation (RI) was conducted at seven of the eight IR sites within FISCA, including Site IR02. Phase I RI (June to November 1992) focused entirely on Site IR02 and included soil sampling and analysis. Phase II RI (March to September 1994) collected additional soil samples at Site IR02.

RI results indicated the presence of PCBs and metals in Site IR02 soils. At an area west of Building 366 PCB concentrations in soil were reported up to 140 mg/kg, with an estimated volume of about 115 cubic yards. Another area was identified along railroad tracks located in the southern portions of Site IR02, containing PCBs above regulatory action concentrations in soil, with an estimated volume of 360 cubic yards.

The findings of the RI were of concern for the DON and it concluded that PCB and cadmium concentrations reported in shallow soils of Site IR02 could pose an unacceptable risk to human health under the then-existing and future planned use of Site IR02: residential on the western one-third and industrial on the eastern two-thirds. Further, both the Interim Covenant executed between the DON and the DTSC in July 2000 and the Quitclaim Deed executed between the DON and the City of Alameda in July 2000 prevented the use of Site IR02 for residential purposes until it was properly remediated.

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3.4 INITIAL RESPONSE

As a result of Site IR02 RI findings, it was determined that two removal actions would be undertaken at three locations within Site IR02, targeting the interim cleanup goals identified by the Regional Water Quality Control Board (RWQCB) and the DTSC. The first removal action, conducted in 1996, involved removal of contaminated soils from an area west of Building 366, with PCBs reported at concentrations up to 140 mg/kg until the interim cleanup level of 1 mg/kg was achieved. About 75 cubic yards of soil was removed. When a confirmatory sample showed that PCBs remained at concentrations above 1 mg/kg along the western sidewall of the excavation, another 5 cubic yards were removed and disposed of off-site. The final five confirmation samples detected no PCBs at a detection limit of 0.033 mg/kg, verifying that the interim cleanup level of 1 mg/kg for PCBs had been achieved.

A second removal action was completed in 1998 in an area in the south-central portion of Site IR02, where soils with PCB concentration of 29 mg/kg had been reported at a depth of 7 feet below ground surface (bgs). This soil sample had been collected near the location of a sump next to a railroad track. About 84 cubic yards of soil was removed and disposed off-site. Confirmation samples verified that the cleanup level of 1 mg/kg for PCBs had been achieved.

3.5 BASIS FOR TAKING ACTION

The Site IR02 RI results had indicated that PCBs and metals were present in Site IR02 shallow soils. A human health risk assessment (HHRA) was conducted in connection with these chemical compounds. An updated risk assessment was conducted in January 1999 as part of the Site IR02 Feasibility Study (FS) at the request of the regulatory agencies to accommodate changes in established toxicity values and exposure parameters since the initial HHRA.

The baseline risk assessment estimated the risks the site would pose if no action were taken. It provided the basis for action and identified the contaminants and exposure pathways that would need to be addressed by the remedial action.

Chemicals of potential concern (COPCs) identified in the shallow soils of Site IR02 included PCBs and metals. These chemical compounds appeared to have originated from the screening lot and scrapyard activities once conducted on Site IR02. Chemicals of concern (COCs) were then derived from these COPCs.

The COPCs reported in Site IR02 soils at the conclusion of the RI were evaluated for human health risks and hazards expressed as excess lifetime cancer risk (ELCR) for carcinogenic compounds, and as a hazard index (HI) for non-carcinogenic compounds. Any COPC found to have an ELCR greater than 10^{-6} or an HI of greater than 1.0 was considered to be a COC. The NCP defines unacceptable risk levels as contaminant concentrations that exceed an ELCR of 10^{-4}, as such, some COC concentrations fell within the 10^{-4} to 10^{-6} target risk management range. For COCs within this target risk range, risk management decisions were made to determine whether remedial action

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would be warranted to address these COCs.

Several metals that exceeded the ELCR or HI were determined not to be COCs, because they were present at concentrations that were equal to or below ambient levels found at the College of Alameda, located just south of Site IR02. The College of Alameda is part of an existing residential development that has never been used for commercial or industrial purposes. Samples from the college property, while not necessarily representative of natural background levels, were used as reference samples with which to compare samples from the historically industrial setting of Site IR02. To make the COC determination regarding metals, the upper 95 percent confidence level (UCL_{95}) of the value of the mean UCL_{95} of each metal was compared with the UCL_{95} of the same metals at the College of Alameda. Metals were eliminated as COC if their UCL_{95} was less than the UCL_{95} at the college property.

The HHRA exposure assessment identified pathways by which contaminants could be released from Site IR02 soils into the environment. The exposure assessment also identified human receptors that could be exposed to these contaminants.

The following exposure pathways were evaluated for PCB and cadmium impacted shallow soils of Site IR02: inhalation of dust and volatilized contaminants, soil ingestion, dermal contact with contaminated soil, and ingestion of produce grown in contaminated soil.

The potential for carcinogenic and noncarcinogenic human health effects under current and future exposure scenarios were evaluated. Potential receptors for current land use were off-site residential receptors (adults and children) and on-site industrial receptors (site workers and construction workers). Off-site residential receptors were only evaluated for the dust inhalation pathway. Current exposure scenarios evaluated were limited to shallow soils ranging in depths from 0 to 0.5 foot below existing ground surface. Potential receptors considered for future land use were on-site residents (adults and children), site workers, and construction workers. Future exposure scenarios were evaluated for the soil from ground surface to the groundwater table to allow for new construction and excavation activities. No sensitive subpopulations, such as farm families or subsistence fishermen, were identified at Site IR02.

Toxicity factors, including carcinogenic slope factors (CSFs) for estimating risk, and reference dose (RfD) for estimating HI, were used to quantitatively evaluate chemical toxicity. These toxicity factors are updated by the United States Environmental Protection Agency (USEPA) when new or revised chemical toxicity information becomes available. The CSFs for PCBs that have been revised since the HHRA presented in the final RI, were incorporated into the FS. More specifically, at the request of the regulatory agencies, the FS recalculated risks for some of the COCs in Site IR02 shallow soils on account of receiving new data since the original HHRA. **PCBs and cadmium in shallow soils of Site IR02 were retained as the COCs and targeted for remediation.**

Three PCB isomers were identified as COCs in the surface soils of Site IR02: Aroclor 1016, Aroclor 1254 and Aroclor 1260. Slope factors for these COCs were

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derived from USEPA's "PCBs: Cancer Dose-Response Assessment and Application to Environmental Mixtures". The original HHRA used a cadmium oral RfD for water of 5.0E-04 mg/kg/day in the evaluation of exposure to soil. A more appropriate oral RfD developed for consumption of food, 1.0E-3 mg/kg/day was used in the updated risk assessment to evaluate exposure to cadmium in soil and in garden produce.

After completion of shallow soil removal actions performed at Site IR02 in 1998, the RI database was updated to reflect the risk reduction achieved by these removal actions. Chemical concentration data representing the soils that were excavated and disposed off-site were removed from the database. The updated database was then used to estimate risk and to map locations of remaining contaminants. **The final soil COCs for Site IR02 shallow soils were cadmium and PCBs.**

A qualitative ecological risk assessment conducted as part of the RI concluded that there were no endangered species present at Site IR02, and that limited and unsuitable habitat, a scarcity of mammalian receptors, and site soil conditions limited the potential for adverse effects to terrestrial biota. **The risk assessment recommended no further evaluation or action for terrestrial habitats or associated ecological receptors.**

On the basis of these findings, the DON and the regulatory oversight agencies agreed that the response action identified in the Site IR02 RAP/ROD, removal of PCB and cadmium impacted shallow soils of Site IR02, and off-site disposal of these soils, would provide the means to protect the public health and welfare, and the environment from actual or threatened releases of PCBs and cadmium reported in Site IR02 shallow soils into the environment.

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Section 4
REMEDIAL ACTIONS

This section provides discussions of remedial action implementation history for the PCB and cadmium impacted shallow soils of Site IR02. It presents relevant site activities beginning with the signing of the RAP/ROD for the PCB and cadmium impacted shallow soils of Site IR02 to the present, and includes discussions of remedy selection and implementation, remedy performance, and the current status of the remedy.

4.1 SELECTED REMEDIES

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The 1966 RI reported that with respect to PCB and cadmium impacted shallow soils of Site IR02, , existing risk of cancer to future site workers was greater than 1.0E-04 for exposure to PCBs, and the existing non-cancer risk hazard index was greater than 1.0 for exposure of future site workers to cadmium. The results of the Site IR02 HHRA had shown that the principal threats to human health under future industrial and residential land use scenarios would be expected to come from dermal contact with soil, as well as inhalation and ingestion of soil, and that these threats would come from PCBs and cadmium reported in shallow soils of Site IR02.

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The RI also reported that there were no unacceptable risks to ecologic receptors, and, as such, the only action required was to address the human health risks. The Site IR02 FS reported that development of remedial action objectives (RAOs) was necessary for PCBs and cadmium in surface soils to address these risks.

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RAOs developed and presented in the Site IR02 Remedial Design (RD) document required establishing cleanup goals for PCBs and cadmium in soils and, reducing exposure to soils that contained these chemicals with concentrations exceeding the established cleanup goals.

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ingestion of, direct contact with, or inhalation of PCB impacted shallow soils (0 to 1 foot below existing ground surface), by future residents in excess of concentrations that exceed an ELCR of 10^{-4},

ingestion of, direct contact with, or inhalation of PCB impacted shallow soils (0 to 1 foot below existing ground surface) in excess of concentrations that exceed an ELCR of 10^{-4}, and,

ingestion of or direct contact with cadmium impacted shallow soils (0 to 1 foot below existing ground surface), by future residents in excess of concentrations that exceed a hazard quotient of 1.

The DON and the State of California signed the RAP/ROD for the PCB and cadmium impacted shallow soils of Site IR02 on June 26, 2001. The RAP/ROD required that the RAOs identify and remove soils that exceed cleanup levels for PCBs and cadmium, which would allow residential use of the western one-third portion of Site IR02 and

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industrial use of the eastern two-thirds portion of Site IR02 with respect to PCB and cadmium impacted shallow soils (Figure 2). The RAP/ROD also required that the DON implement land use controls which would prevent future redevelopment of the industrial use portion of Site IR02 for residential use for as long as PCB and cadmium concentrations in shallow soils of Site IR02 remained above residential use cleanup levels.

The cleanup levels selected for PCBs and cadmium in shallow soils of Site IR02 are as follows.

COC	Residential Cleanup Level (milligram per kilogram)	Industrial Cleanup Level (milligram per kilogram)
Total PCBs	1.0	10.0
cadmium	12.0	450

The selected action for remediating PCB and cadmium impacted shallow soils of Site IR02 involved removing these soils from both the planned residential (western) area and from the planned industrial (eastern) area of Site IR02, and imposing land use controls on the industrial use portion. This remedy was selected in conformance with the planned reuse of Site IR02 as required by the Office of Solid Waste and Emergency Response Directive 9355.7-04 "Land Use in the CERCLA Remedy Selection Process," May 25, 1995.

In accordance with the selected remedy for the planned residential use area, soils impacted with PCBs and cadmium in excess of residential cleanup standards (1 and 12 mg/kg, respectively) would be excavated and placed in a staging pile on the site. In the planned industrial use area, soils impacted with PCBs and cadmium in excess of industrial cleanup standards (10 and 450 mg/kg, respectively) would be excavated and placed in a staging pile on the site. Excavated areas would be backfilled with 'clean' fill. Erosion and runoff controls would be implemented to prevent migration of excavated soils away from the staging areas. PCB and cadmium impacted soils would be disposed of in permitted off-site Class I, II or III landfills, depending on the PCB and cadmium concentrations reported in the staged soil stockpiles and the classification of the waste.

The results of shallow soil investigative sampling conducted during the remedial action determined that over half of the shallow soils of Site IR02 exceeded the cleanup level for either PCBs or cadmium. The average PCB concentration in the remedial action investigative samples was 12.1 mg/kg, and the average cadmium concentration in the remedial action investigative samples was 23.4 mg/kg. The highest PCB concentration reported was 884 mg/kg, and the highest cadmium concentration reported was 377 mg/kg in the remedial action investigative soil samples.

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The areal extent and volume of soil to be excavated and removed from Site IR02 was estimated on the basis of the future land use plans for Site IR02. The Catellus Project Master Plan devotes the western one-third of Site IR02 (approximately 2.5 acres) to residential use and the eastern two-thirds of Site IR02 (approximately 8.1 acres) to industrial use. The Site IR02 RI data has indicated that 70 percent of the soil samples taken from the residential use area within depths of 0 to 1-foot below existing ground surface exceeded the residential cleanup levels of 1 mg/kg for PCBs and 12 mg/kg for cadmium. Likewise, 30 percent of the planned industrial use area soil samples exceeded the industrial cleanup levels of 10 mg/kg for PCBs and 450 mg/kg for cadmium. In remedial planning, on the basis of the RI data and for conservatism, it was assumed that 80 percent of the planned residential use area could exceed residential cleanup levels and that 35 percent of the planned industrial use area could exceed industrial cleanup levels. Remediation cost and volume estimates were derived using these assumptions with the understanding that actual volumes and cost could likely change during remedy implementation. Based on these assumptions, the estimated area of soil remediation was about 5 acres. Confirmation samples would be collected after completion of soil excavation, and prior to backfilling of excavated areas.

4.2 REMEDY IMPLEMENTATION

Remedial soil excavation began on July 5, 2001. Initially, a 6-inch thick layer of soil and other debris were excavated from each area in which the soil cleanup level for PCB or cadmium was exceeded, and confirmation samples were collected from remaining soils in the center and at the edge of the excavated areas. Additional 6-inch thick layers of soil were excavated in and at the edge of each area where the confirmation samples still exceeded one of the cleanup levels, until all confirmation samples no longer exceeded either of the two cleanup levels for PCBs and cadmium. As a result, soils were excavated to depths of as much as 2 feet below existing ground surface in some areas of Site IR02 (Figure 3).

A total of 16,080 tons of soil and debris were found to exceed at least one of the two cleanup levels and were removed from Site IR02 for off-site disposal. Samples of the soil and debris that exceeded the cleanup levels were analyzed using the toxicity characteristic leaching procedure (TCLP) under RCRA to determine if the soil was a RCRA hazardous waste. Samples of the soil that exceeded the cleanup levels were also analyzed using the State of California Waste Extraction Test to determine whether the soil was a California hazardous waste. The waste soil and other debris were then segregated into appropriate stockpiles on the site, and were then shipped to appropriate disposal facilities permitted to accept the wastes.

The removal of PCB and cadmium impacted shallow soils from Site IR02 was completed the week of November 5, 2001. After completing the removal of these soils, Site IR02 was returned to nearly its original grade by the placement of about 14,230 tons of 'clean' backfill soil. The backfilling of excavated areas was completed on November 6, 2001.

The Final Closeout Report for Site IR02, dated December 26, 2001, reports that PCB and

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Excavations in a portion of the residential use area uncovered the remains of what appeared to be various types of instruments. Because of the concern that instrument dials used during the World War II era sometimes used radium paint for illumination, further investigation was conducted at this location. All the soils that had been excavated from within this area were spread out in a 1-foot thick layer and screened with a gamma scintillation detector capable of detecting radiation emitted by radium. There were no detections of radiation above background.¶
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cadmium impacted shallow soil remedial excavation activities at Site IR02 have been completed in accordance with the requirements of the Site IR02 RAP/ROD, and that these soils have been removed from areas identified by the investigative samples as exceeding either one of the two soil cleanup levels for PCBs and cadmium selected for mitigation of Site IR02 shallow soils. All confirmation samples collected and analyzed in accordance with the FSP/QAPP after the final round of soil excavation have reported PCB and cadmium levels below the cleanup levels specified in the RD and the RAP/ROD. Thus, further soil excavation was not deemed to be necessary because the PCB and cadmium cleanup goals as approved in the RAP/ROD had been achieved. No further remedial action was planned to be taken on the shallow soils of the western one third of Site IR02 in reference to PCB and cadmium impacted shallow soils, and this portion of Site IR02 was deemed to be ready for unrestricted residential use with respect to remediation of PCB and cadmium impacted shallow soils. The Site IR02 closeout report also states that no further remedial action would be taken on the PCB and cadmium impacted shallow soils of the eastern two-thirds of Site IR02, and that this portion of Site IR02 is deemed to be ready for commercial and industrial use in reference to PCB and cadmium impacted shallow soil remediation, however, this area was restricted from residential use. Therefore, no land use controls (LUC) were deemed necessary for the western one-third of Site IR02 in reference to PCB and cadmium impacted shallow soils, while LUCs were required for the eastern two-thirds of the property for the purposes of restricting this portion of Site IR02 from residential use in reference to PCB and cadmium impacted shallow soils.

No active engineering or construction would be required to implement this remedy. Roles and responsibilities for implementing and enforcing the land use controls remedy will be documented in a Land Use Control Remedial Design (LUC RD) planned to be prepared by the DON in FY 2006. The LUC RD would address the following elements:

- Description of Site IR02.
- A map showing the location and approximate size of Site IR02 and a description of any COCs.
- The land-use control objectives and restrictions stated in the RAP/ROD.
- The specific legal mechanism that will be used to achieve the RAP/ROD'S land use control objectives and restrictions.
- The required frequency and nature of periodic inspections of Site IR02 areas restricted from residential use.
- Identification of the entities responsible for implementation of these monitoring and inspections.
- Methods to be used to periodically certify compliance with the land use controls remedy upon completion of inspections, i.e.,

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five-year reviews.

Procedures for notifying the DON and regulatory oversight agencies in the event of a failure to comply with land use restrictions.

The DTSC has agreed with the successful completion of the PCB and cadmium impacted shallow soil remediation conducted at Site IR02. In its letter dated February 27, 2004 to the DON, the DTSC acknowledges its receipt and review of the final closeout report dated December 26, 2001 for Site IR02 PCB and cadmium impacted shallow soil remediation. In its letter, the DTSC also states that it concurs that the DON has remediated the PCB and cadmium impacted shallow soils of Site IR02 pursuant to the RAP/ROD for Site IR02 shallow soils, and acknowledges that all confirmation samples collected after final soil excavation show PCB and cadmium concentrations remaining in Site IR02 shallow soils to be below the selected cleanup levels for these two chemical compounds. The DTSC has determined that remediation of PCB and cadmium impacted shallow soils at Site IR02 has been completed, and that no further physical action is necessary to remediate PCB and cadmium in the shallow soils of Site IR02.

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Section 5
PROGRESS SINCE THE LAST FIVE-YEAR REVIEW

This is the first five-year review of the remedies implemented for the PCB and cadmium impacted shallow soils of Site IR02, located at the former FISCA property.

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Section 6
FIVE-YEAR REVIEW PROCESS AND FINDINGS

This section discusses the five-year review process undertaken for the PCB and cadmium impacted shallow soils remediation undertaken at Site IR02, and presents its findings. This five-year review was conducted according to procedures described in DON's May 21, 2004 policy for conducting five-year reviews for DON sites, and in accordance with procedures described in USEPA's June 2001 guidance for conducting five-year reviews of NPL or non-NPL sites.

6.1 FIVE-YEAR REVIEW ADMINISTRATIVE COMPONENTS

The lead agency responsible for this five-year review was the DON. The CDM/Brown and Caldwell Team provided technical and community relations support to the DON.

During April and May 2005 the DON, CDM, and Brown and Caldwell established a team and schedule for the five-year review of PCB and cadmium impacted shallow soils of Site IR02 remedies. The components of this five-year review included:

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- Community involvement;
- Review of relevant documents, data, reports, and agreements related to PCB and cadmium impacted Site IR02 shallow soil remediation;
- Review of federal and state applicable or relevant and appropriate requirements (ARARs) cited in the decision documents for PCB and cadmium impacted Site IR02 shallow soil remediation;
- Site IR02 visit and inspection;
- Interviews with staff of the DON, DTSC, Catellus, City of Alameda, and the Restoration Advisory Board (RAB); and,
- Preparation of this five-year review report.

The schedule for overall completion of this first five-year review for the Site IR02 PCB and cadmium impacted shallow soil remediation extends through July 2006.

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6.2 COMMUNITY INVOLVEMENT

Community interest in Site IR02 PCB and cadmium impacted shallow soil remediation has been extensive, as can be judged from the many comments received on this subject by the DON from the community during the preparation of the Proposed Plan (PP) and the RAP/ROD for PCB and cadmium impacted shallow soils of Site IR02. At that time the community had expressed concern as to whether the cleanup goals for PCBs and cadmium for Site IR02 shallow soils were indeed protective of human health. A specific concern was expressed by the East Bay Municipal Utility District (EBMUD), the local water utility for the City of Alameda, for the protection of its utility workers who would be installing water service utilities at Site IR02 in the future. The DON responded by confirming that the cleanup levels selected for PCBs and cadmium in shallow soils for the

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planned residential use portion of Site IR02 would be consistent with planned unrestricted use of this portion, including installation of utilities. Following the public comment period, the DON revised the cleanup level of PCBs to 10 mg/kg for the planned industrial use portion of Site IR02, based on an exposure model that assumed continuous exposure, 24 hours per day, 7 days per week, 365 days per year; an exposure scenario which was deemed by the DON to be more conservative than the expected lower frequency of exposure by typical utility workers, and more conservative than required by Occupational Safety and Health Association (OSHA).

Another concern expressed by the community involved whether the HHRA for the PCB and cadmium impacted shallow soils of Site IR02 included ingestion of produce grown in the planned residential use portion of Site IR02, and whether there would be land use controls which would prohibit this activity. The DON responded that growing produce in the planned residential use portion of Site IR02 was included in the human health risk assessments, and that since the cleanup levels selected for PCB and cadmium impacted shallow soils of this portion of Site IR02 would allow for unrestricted use of the property, no prohibitions on ingestion of produce grown on this property would be necessary. However, land use restrictions would be placed on the eastern industrial use portion of Site IR02.

A major goal of the DON's community relations program during the course of investigations and remediation it has conducted for the PCB and cadmium impacted shallow soils of Site IR02 has been to keep the local community in Alameda informed of its activities. To that affect, it has met regularly with the RAB and the Base Closure Team (BCT) and provided them with the progress being made on the project. In April 2001 the DON issued its PP describing its preferred remedy for the PCB and cadmium impacted shallow soils of Site IR02.

The DON will place public notices in the local Alameda newspapers announcing the preparation of this five-year review of remedies implemented for PCB and cadmium impacted shallow soils of Site IR02. The DON will also prepare a fact sheet on this five-year review.

6.3 DOCUMENT AND DATA REVIEW

As part of this five-year review, Brown and Caldwell conducted reviews of numerous documents related to PCB and cadmium impacted shallow soil remediation activities completed at Site IR02. These reviews focused primarily on documents which provided an insight into the technical and regulatory analyses and considerations that led to the remedies selected for the PCB and cadmium impacted shallow soils of Site IR02, and insight into the implementation of these remedies. These documents contained site-specific data which were also reviewed as part of this task.

The RI and FS reports, as well as the RAP/ROD and the Closeout Report for Site IR02 provided data and information on the human health and ecological risk assessments conducted for the PCB and cadmium impacted shallow soils of Site IR02, descriptions of pre-remedial- action soil removal events, descriptions of the COCs in the shallow soils of

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Site IR02 (PCBs and cadmium), identified the RAOs as well as the ARARs for the PCB and cadmium impacted shallow soils of Site IR02, described the selection process of the final remedy and the basis for that selection, implementation of the remedy, and post-remedy-implementation confirmations.

Numerous agreements made between the DON and the City of Alameda as well as the DTSC provided information on the regulatory oversight provided for the PCB and cadmium impacted shallow soils of Site IR02, as well as an understanding of the land use restrictions placed on the planned industrial use portion of Site IR02 with respect to the PCBs and cadmium reported in the shallow soils of Site IR02. These agreements include the Quitclaim Deed between the DON and the City of Alameda, and the covenants between the City of Alameda and DTSC and between the DON and DTSC.

Collectively, these documents and some others (in combination with personal interviews) provided information to this five-year review which allowed developing a chronology of site events, and an understanding of the involvement of the regulators and the community in the remedial action selection and implementation process for the PCB and cadmium impacted shallow soils of Site IR02.

Attachment A provides a listing of relevant Site IR02 related documents included in this five-year review. Data review is discussed in Section 7 of this five-year review report.

6.4 SITE VISIT AND INSPECTION

Representatives of the DON, Brown and Caldwell, and Catellus physically and visually inspected Site IR02 on May 10, 2005. Conditions during the site visit were favorable, with clear weather and no precipitation. The entire Site IR02 was accessible to the site inspection team.

The purpose of this site inspection was to assess the protectiveness of the remedies implemented for the PCB and cadmium impacted shallow soils at Site IR02, including confirming the presence of fencing to restrict access, and to discuss land use controls implemented for the planned industrial use portion of Site IR02 with respect to PCB and cadmium impacted shallow soils.

No significant issues have been identified at any time following the completion of the PCB and cadmium impacted shallow soil remedial actions implemented at Site IR02 and none were identified at the time of this site inspection. Construction activities by the redevelopment contractor Catellus were well underway within the site. Visual examination of Site IR02 revealed that its surface was essentially level and graded to elevations generally matching those of the adjacent properties. There were no discernible signs of soil erosion due to forces such as vehicular (construction) traffic, wind, or surface flow caused by rainfall. Site IR02 appeared to be well secured by fencing surrounding it. Vehicular and pedestrian access into Site IR02 was further restricted by Catellus as part of its site control during its ongoing construction activities. Residential or commercial structures had not yet been constructed on Site IR02 at the time of this site visit and inspection. A storm-water pumping station, located approximately on the

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boundary between the residential use and industrial use portions of the site, was in its final stages of construction. Attachment B contains the site inspection form providing findings of the Site IR02 inspection conducted on May 10, 2005. Attachment C contains photographs of Site IR02 taken during the site inspection of May 10, 2005.

6.5 INTERVIEWS

Interviews were conducted with individuals representing various entities connected to the remedial actions implemented for PCB and cadmium impacted shallow soils at Site IR02, as listed below.

Mr. Thomas Macchiarella, Alameda BRAC Environmental Coordinator, BRAC Program Management Office West

Mr. Lou Ocampo, P.E., Remedial Project Manager, Department of the Navy

Mr. Doug DeLong, Environmental Compliance Manager, BRAC Program Management Office West

Mr. Henry Wong, Remedial Project Manager, California Environmental Protection Agency, Department of Toxic Substances Control

Mr. Philip Owen, Director of Construction, CATELLUS Commercial Development Corporation

Ms. Debbie Potter, Base Reuse & Redevelopment Manager, City of Alameda

Peter Russell, Ph.D., P.E., Principal, Russell Resources, Inc., Consultant to the City of Alameda

Mr. Gregory McFann, Chief, Planning and Building Department, City of Alameda

Mr. Ken Hansen, Community Co-Chair, Alameda Annex Restoration Advisory Board

An interview documentation form listing the name, title, and organization of each interviewee, along with the date and location where each interview took place, is provided in Attachment D. Individual interview records documenting each interview are contained in Attachment E.

No significant problems or concerns regarding remediation of PCB and cadmium impacted shallow soils at Site IR02 were identified during the interviews. There had not been any emergency responses in connection with the PCB and cadmium impacted shallow soil remedies implemented at Site IR02.

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Section 7
TECHNICAL ASSESSMENT

This section provides an assessment of the performance and effectiveness of the remedial actions implemented for PCB and cadmium impacted shallow soils at Site IR02 in satisfying the RAP/ROD requirements for protection of human health and the environment. This assessment is based on document and data review, site inspection, interviews, and evaluations provided further below.

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Technical assessment components of this five-year review focuses on responses to the following three key questions:

Question A: Is the remedy functioning as intended by the decision documents?

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of remedy selection still valid?

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Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

Responses to these questions are provided below.

7.1 QUESTION A: IS THE REMEDY FUNCTIONING AS INTENDED BY THE DECISION DOCUMENTS?

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Yes. The review of documents and data, site inspection, and interviews indicate that the remedies implemented for PCB and cadmium impacted shallow soils at Site IR02 are functioning as intended by the decision documents (RAP/ROD). The removal of soils with PCB and cadmium concentrations exceeding cleanup levels for the planned residential use area (western one-third of Site IR02) and exceeding cleanup levels for the planned industrial use area (eastern two-thirds of Site IR02) have been completed, thus achieving the RAOs for preventing direct contact with, or ingestion of, PCB, and cadmium impacted shallow soils of Site IR02 exceeding cleanup levels.

Land use controls are in place that prohibit residential use of the eastern two-thirds of Site IR02 with respect to PCB and cadmium impacted shallow soils. There are no land use controls on the western one-third of Site IR02 for unlimited residential use of this area with respect to the remediated PCB and cadmium impacted shallow soils.

Fencing around Site IR02 was observed to be intact and in good repair, and an extensive construction activity for redevelopment was observed to be underway at Site IR02 at the time of the site inspection conducted on May 10, 2005. Access into Site IR02 by unauthorized persons was prohibited. Those entering the site were required to wear hard hat and reflective vest as part of the construction site safety rules. The Site IR02 redevelopment contractor Catellus Development Corporation's Site Management Plan (SMP) for Site IR02 redevelopment activities was in place and guided the daily and long

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term activities of the project. Catellus is on site and it is knowledgeable of the Site IR02's past and the requirements of its SMP.

7.2 QUESTION B: ARE THE EXPOSURE ASSUMPTIONS, TOXICITY DATA, CLEANUP LEVELS, AND REMEDIAL ACTION OBJECTIVES USED AT THE TIME OF REMEDY SELECTION STILL VALID?

Yes. The assumptions made at the time of remedy selection are generally unchanged. The remediation of PCB and cadmium impacted shallow soils of Site IR02 has been completed as intended by the decision documents. There have been no discernible changes in the post-remedy physical condition of shallow soils at Site IR02 that would affect the protectiveness of the remedies implemented with respect to PCB and cadmium impacted shallow soils at this site. The future land use expectations at and near Site IR02 have not changed. No newly identified contaminants or contaminant sources that would impact the remediated PCB and cadmium impacted shallow soils of Site IR02 have been identified or reported.

As part of the response to this question, the ARARs, and the assumptions concerning PCB and cadmium exposure and toxicity data, were evaluated, as discussed below.

Changes in ARARs

The ARARs identified in the Site IR02 RAP/ROD were reviewed, as listed in Attachment F. The listing includes the citation for the ARAR, a brief description of the regulated parameter, the reference for the latest regulation reviewed, and a brief conclusion as to whether any updates to the regulation were identified that could potentially affect the protection of human health and the environment.

No changes to the ARARs evaluated in the Site IR02 RAP/ROD were identified that could potentially affect the protectiveness of the PCB and cadmium impacted shallow soil remedial actions implemented at Site IR02 for protection of human health and the environment. In addition, no new ARARs were identified. However, the DTSC has recently adopted regulations for the purpose of establishing a standard for implementation of land use controls remedies where chemicals of concern remain at a site in concentrations not suitable for unrestricted use of that site. Effective April 19, 2003, the DTSC has added Section 67391.1, Land Use Covenants Regulations, to Title 22, Division 4.5, Chapter 39 of California Code of Regulations (CCR), as provided in Attachment F.

Although it does not appear that these post-RAP/ROD regulations include any 'new' substantive requirements that are necessary to protect human health and the environment and that were not already covered by the underlying statutory ARARs identified and described in the Site IR02 RAP/ROD, the DON has agreed to accept substantive provisions of these regulations as "relevant and appropriate" state ARARs.

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Changes in Exposure Pathways, Toxicity, and Cleanup Levels.

The HHRA conducted for the PCB and cadmium impacted shallow soils of Site IR02 was reviewed, as discussed in Attachment G. The HHRA has been conducted using the DTSC's exposure assumptions which are still current. The only value that has changed since then is the residential adult exposure frequency for dermal contact with soil. However, this change would not impact the residential cleanup level as it was calculated for a child.

7.3 QUESTION C: HAS ANY OTHER INFORMATION COME TO LIGHT THAT COULD CALL INTO QUESTION THE PROTECTIVENESS OF THE REMEDY?

No. This five-year review did not discover information that would call into question the protectiveness of the PCB and cadmium impacted shallow soils remedies that have been implemented at Site IR02. Ecological receptors were not identified at Site IR02 in the baseline risk assessment; none were identified in this five-year review, and none were discernible during the site inspection. The PCB and cadmium impacted shallow soils of Site IR02 exceeding cleanup levels have been removed from Site IR02, as confirmed by post-remedy confirmation soil sampling and analyses, and the excavated areas have been backfilled with soils having acceptable environmental properties.

7.4 TECHNICAL ASSESSMENT SUMMARY

Based on the findings of this five-year review, the PCB and cadmium impacted shallow soil remedies selected for Site IR02 have been implemented as intended by the decision documents, and the completed remedies continue to meet the RAOs, and provide the means for adequately protecting the human health and the environment at Site IR02 in reference to PCB and cadmium impacted shallow soils of Site IR02.

Physical changes to Site IR02, other than those resulting from redevelopment of the site in accordance with the decision documents, were not discovered. No changes to the ARARs identified for PCB and cadmium impacted shallow soils of Site IR02 were identified that could potentially affect the protectiveness of the shallow soil remedial actions implemented for human health and the environment. In addition, no new ARARs were identified. The human health risk assessment for PCB and cadmium impacted shallow soils of Site IR02 has been conducted using the DTSC's exposure assumptions. The only value that has changed since then is the residential adult exposure frequency for dermal contact with soil. However, this change would not impact the residential cleanup level as it was calculated for a child. As such, there have not been changes to the standardized risk assessment methodology that would affect the protectiveness of the PCB and cadmium impacted shallow soil remedies implemented at Site IR02.

This five-year review did not discover information that would call into question the protectiveness of the PCB and cadmium impacted shallow soil remedies that have been implemented at Site IR02.

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Although the decision document (RAP/ROD) for PCB and cadmium impacted shallow soils of Site IR02 did not require a Land Use Control Implementation and Certification Plan (LUCICP), the DON has generally agreed with environmental regulators that, land use controls remedies depend heavily upon long-term follow through, oversight, and enforcement to ensure their reliability and effectiveness. As such, the DON plans to accomplish oversight and long-term monitoring of the land use controls remedy for the industrial use portion of Site IR02 through the preparation of a Land Use Control Remedial Design (LUC RD) for Site IR02 in FY 2006. The LUC RD will develop protocols for the enforcement and monitoring of land use restrictions implemented at the eastern, planned industrial use portion of Site IR02 with respect to PCB and cadmium impacted shallow soils of Site IR02.

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Section 8
ISSUES, CONCLUSIONS, RECOMMENDATIONS

This five-year review did not discover new issues relative to the performance of the PCB and cadmium impacted shallow soil remedies implemented at Site IR02. Shallow soils with PCBs and cadmium exceeding cleanup levels identified separately for the planned residential use and planned industrial use portions of Site IR02 have been excavated, and removed from Site IR02. Land use controls and environmental covenants are in effect that separate the residential and industrial use portions of Site IR02 and that restricts the industrial use portion to only industrial use and not for residential use in reference to PCB and cadmium impacted shallow soils of Site IR02. Site IR02 is under development in accordance with decision documents and under the oversight of regulatory agencies. Site conditions that could result in having potential adverse effects on the future protectiveness of the remedy were not observed.

Based on the findings of this five-year review, the PCB and cadmium impacted shallow soil remedies for Site IR02 have been implemented as intended by the decision documents, and the completed remedies continue to meet the remedial action objectives, and provide the means for adequately protecting human health and the environment at Site IR02 in reference to PCB and cadmium impacted shallow site soils. The DON intends to prepare a LUC RD for Site IR02 in FY 2006, which will develop protocols for the enforcement and monitoring of land use restrictions implemented at the eastern, planned industrial use portion of Site IR02 with respect to PCB and cadmium impacted shallow soils of Site IR02.

The PCB and cadmium impacted shallow soil remedies implemented at Site IR02 currently provide the protectiveness of human health and the environment intended by the decision documents. Concentrations of PCBs and cadmium in shallow soils of Site IR02 have been reduced to levels acceptable separately for the two land use scenarios identified for Site IR02, suitably addressing the threats to human health and the environment at Site IR02 through removal of unsuitable PCB and cadmium impacted shallow soils to regulated off-site disposal facilities. Land use controls in effect clearly delineate the planned residential and industrial use portions of Site IR02 with respect to PCB and cadmium impacted shallow soils of Site IR02. The Catellus Development Corporation's SMP in use at Site IR02 provides guidelines for conducting the redevelopment of Site IR02 in a manner protective of the health and safety of site workers, future site residents, nearby residents, and the environment. Technical or physical issues related to remedies implemented for PCB and cadmium impacted shallow soils of Site IR02 that would be likely to reverse the current conditions were not discovered in this five-year review.

On the basis of the findings of this five-year review, conducting further five-year reviews for the remediated PCB and cadmium impacted shallow soils of the planned residential use portion of Site IR02 was not found to be warranted.

Land use controls have been put into effect for the eastern two-thirds portion of Site IR02 which is currently being developed under an industrial use scenario. This portion of Site IR02 has not been accepted by the regulatory oversight agencies as being suitable for unrestricted exposure and unlimited use, without restrictions, with respect to PCB and cadmium impacted shallow soils.

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The Quitclaim Deed entered into between the DON and the City of Alameda, and the Interim Covenant to Restrict Use that prohibit residential use of the eastern two-thirds of Site IR02 with respect to PCB and cadmium impacted shallow soils, entered into between the DON and DTSC (Attachment H), were reviewed and determined to be properly executed and recorded. These documents are deemed to be in full force and effect and to be "in place." Activities that would have violated these land use controls were not observed under this five-year review. An interview with DTSC, and a visit to and interview at Alameda City Hall confirmed that these land use controls are currently in effect.

The DTSC, in its letter to the DON dated February 27, 2004 (Attachment H) states that remediation of PCB and cadmium impacted shallow soils of Site IR02 has been completed, and that no further physical action is necessary to remediate PCB and cadmium in the soils of Site IR02.

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Section 9
PROTECTIVENESS STATEMENT

The PCB and cadmium impacted shallow soil remedies implemented at Site IR02 currently provide the protectiveness of human health and the environment intended by the decision documents. Concentrations of PCBs and cadmium in shallow soils of Site IR02 have been reduced to acceptable levels, suitably addressing the threats to human health and the environment at Site IR02 through removal of unsuitable PCB and cadmium impacted shallow soils to regulated off-site disposal facilities. Land use controls in effect clearly delineate the residential and industrial use portions of Site IR02 with respect to PCB and cadmium impacted shallow soils of Site IR02. The Catellus Development Corporation's SMP provides guidelines for its redevelopment of Site IR02 in a manner protective of the health and safety of site workers, future site residents, nearby residents, and the environment. Technical or physical issues related to the remedies implemented for PCB and cadmium impacted shallow soils of Site IR02 that would be likely to reverse the current conditions were not discovered in this five-year review.

A LUC RD, planned to be prepared by the DON for Site IR02 in FY 2006, will develop protocols for the enforcement and monitoring of land use restrictions implemented at the eastern, planned industrial use portion of Site IR02 with respect to PCB and cadmium impacted shallow soils of Site IR02.

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Section 10
NEXT FIVE-YEAR REVIEW

Land use controls are currently in effect for the eastern two-thirds of Site IR02 planned for industrial use in reference to PCB and cadmium impacted shallow soils of Site IR02. As such, there needs to be a review of the protectiveness of this remedy within the next five years, or before July 2011.

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The next five-year review of this land use controls remedy should include reviews of ARARs and risk assessments with respect to PCBs and cadmium remaining in the shallow soils of the planned industrial use portion of Site IR02 to assess whether changes to the ARARs or cleanup levels may have occurred during the five years from the five-year review presented herein, as well as redevelopment and land use history of the industrial use portion of Site IR02 over the next five years. Site inspection as well as interviews should focus on whether there have been violations of the land use controls and restrictions currently in effect for the industrial use portion of Site IR02 with respect to PCB and cadmium impacted shallow soils of Site IR02 and under the protocols to be established in the LUC RD planned to be prepared by the DON for Site IR02 in FY 2006.

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In the event the industrial use portion of Site IR02 is considered at a future time to be converted to residential use, then, in accordance with the environmental covenants and land use controls currently in effect for the PCB and cadmium impacted shallow soils of Site IR02, additional soil investigations and remediation could be necessary. As such, the next five-year review of the land use controls remedy implemented for the planned industrial use portion of Site IR02 should also include reviews of any such remedial actions, in addition to site inspection and interviews focused on the remedy implementation and whether this portion of Site IR02 has become acceptable to the regulatory oversight agencies as being suitable for unrestricted exposure and unlimited use with respect to PCB and cadmium impacted shallow soils..

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